IRA Proposal 0475

Instructionally Related Activities:

HABITAT CHOICE IN HAWAII'S HUMPBACK WHALES; MARCH 16TH – 23RD 2013

Supplemental material – Answers to questions

(1) PROVIDE A DESCRIPTION OF THE ACTIVITY;

This activity comprises a seven day trip to the island of Maui, Hawaii, where students join an established non-profit research organization, The Keiki Kohola Project, to assist in an on-going research study looking at habitat use by female-calf humpback whale pairs in Hawaiian waters. Students stay in Lahaina, a small town on the west coast of Maui, they are out on the water each day and actively engaged in gathering data while working alongside experienced members of the research team.

Prior to leaving for Maui, all student participants take a three unit course that covers scientific methods, the behavioral ecology of marine mammals and relevant aspects of marine conservation biology. Students work in groups to prepare possible projects to address specific questions during their time in Hawaii. While in the field, the research is conducted under a federally issued research permit held by R. Cartwright (trip leader, CI lecturer) and following the trip, students are engaged in all aspects of data analysis. While on the island students have time allowed for snorkeling, hiking and exploring the local area to some extent, however the emphasis is very much on time spent on the water engaged in the research project.

(2) HOW DID THE ACTIVITY RELATE TO A COURSE(S) AND/OR LEARNING OBJECTIVES?

The course that students complete prior to leaving for Maui is designed, along with the on-island activities, to directly address the course learning objectives for University 394.

Time spent reviewing relevant literature introduces students to the principles of behavioral ecology, the natural history of marine mammals and the underlying challenges of associated resource management. Students design their own experiments for possible implementation during their time on Maui, providing experience in developing feasible questions, formulating original hypotheses, designing appropriate methods of data collection and planning subsequent methods of statistical analysis. Peer review of the research proposals in the classroom setting prior to heading to Maui leads to discussion of experimental techniques and study design, and provides the opportunity for problem-solving and critical thinking. Once the students arrive on Maui, they gain first-hand experience of the many inherent challenges involved in the translation of a proposed experimental design into a practical field setting. Each year, the students chose one or two specific studies designed by the group to incorporate into the field work on Maui. When they return to college, some students work with their own datasets, while others utilize the long term field

data gathered over the course of the study and all students are actively involved in the presentation of their findings at the annual Sage Conference. Overall, the students are provided with a unique hands-on experience that takes then through the process of scientific research and investigation from the development of a research question, to the presentation of their findings.

Over the course of these activities, this therefore addresses many of the key objectives of UNIV 394. Additionally, the course also addresses learning objectives form a range of other classes, including the Biosphere (Biol 335), Behavioral Ecology (Biol 407) Marine Biology (Biol 312), Science and Public Policy (Biol 345) Quantitative Methods in Biology (Biol 203), Environmental Chemistry (Chem 301) and Quantitative Analysis (Chem 250/ 251).

(3) WHAT DO YOU SEE AS THE STRENGTHS OF THE ACTIVITY?

As part of this activity, students are provided with the opportunity to work as part of federally permitted research team, and contribute to ongoing efforts for the conservation of a federally listed, endangered species. This is a truly unique opportunity, and is especially useful for those students planning a career in this field. Additionally, I believe students benefit greatly from the experience of working out problems in a real world setting. Leaving the students to decide on issues such as methods of recording data, handling field notes, interpreting data recorded by other students, liaising with other group members and generally meeting the challenges of undertaking field work in an often inclement and challenging environment provides students with the opportunity to build life skills that then translate across their subsequent studies. Students build on their abilities to communicate, mediate amongst their peer group and function as a team member. Additionally, over the several years that this course has now been running, students who may not excel in the more traditional educational environmental have emerged as group leaders within this unique setting. Particularly for these students, the experience seems especially impactful and formative, and certainly a key component of their university education.

(4) WHAT WOULD YOU SAY ARE/WERE THE ACTIVITY'S WEAKNESSES?

One challenge that we face each year is the limited group size. In 2013, 10 students participated, with an 11th student returning as a student mentor. With only a five day period to submit applications, we received over 80 applications for the class, which means a lot of very keen students do not get to participate. However, moving forward, we hope to implement related studies of local cetacean populations here in Californian waters, working with the Channel islands Boating Center and also making use of some of the potential opportunities offered through the Santa Rosa Island Field station. These activities will be

designed to build on the enthusiasm and expertise developed on our Maui program, but will allow for greater participation in terms of overall numbers of student participants.

A second challenge is maintaining a balance between the many island activities, and the actual research work that the students are involved in. Early morning starts and long days on the boats mean that evening lectures are not necessarily possible; however, this year we did set aside one day for alternate cultural activities and this proved very popular with the students.

(5) HOW WOULD YOU IMPROVE THIS ACTIVITY FOR NEXT TIME?

As mentioned above, in future we would plan to set aside a day for alternate, culturally-based activities on the island. This seems to develop a better sense of place in the students. Additionally, in planning ahead, setting aside a set time for the class to meet, both before and after the trip seems to better ensure that all the students on the course stay fully engaged in all aspects of post trip data analysis. Logistically, this was a challenge last year, however it is definitely a key, essential component of the course and needs to be built into the schedule at the outset.

(6) WHAT DID YOU LEARN FROM THE PROCESS?

1. Students need to be encouraged to allocate specific time for pre-trip preparation and post trip data analysis within their weekly schedule.
2. The more students are exposed to the process of research, the better they become at developing their skills in areas such as experimental design, problem solving and independent organization.
3. Given the opportunity, students from our classes still surprise me with their dedication and commitment to the stewardship of our natural resources.